CASTER BRAKE SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to a caster brake system having a connection frame and rollers both of which are stopped in a braking operation.

BACKGROUND OF THE INVENTION

[0002] A conventional stroller or shopping cart having casters generally equipped with a brake system for the wheels and generally a stop rod is inserted into the rim of the wheel to stop the shopping cart. Nevertheless, this conventional brake system can only stop the wheel but the frame which is rotatably connected to the wheel so that if the shopping cart moves along a downward slope, even if the wheels are stopped, the frames could rotate an angle and this results in falling of the goods on the cart. Another well-known brake system is to shift a brake bar to touch the outer surface of the wheel. This accelerates the worn of the wheel and the inherent problem is not improved.

[0003] The present invention intends to provide a caster brake system wherein the frame connected to the wheel is held in position when the wheel is stopped.

SUMMARY OF THE INVENTION

[0004] In accordance with one aspect of the present invention, there is provided a caster brake system that comprises a connection unit having a connection plate for connected with a cart or a stroller. A tubular member is connected to an underside of the connection plate so as to receive an upper cam that is rotatably received therein and a lower cam. The upper cam has first protrusions on an underside thereof and the lower cam has second protrusions on a top thereof. The lower cam is moved downward when a peak of each of the first protrusions contacts a

peak of the second protrusion corresponding thereto. A disk is connected to an underside of the lower cam and has teeth on an outer periphery thereof.

[0005] A frame unit has a frame having an open top so as to receive the lower cam and a hole is defined through a bottom of the frame. A plurality of notches is defined in an inner periphery of the hole so as to match with the teeth of the disk when the disk is moved toward the hole. Two plates are connected to an underside of the frame and two wheel support arms extend from the two plates.

[0006] A braking unit has a pushing member pivotably located between the two plates and a first end of the pushing member can be pushed by the underside of the lower cam. A braking member is pivotably mounted to the two plates and a first end of the braking member can be pushed by a second end of the pushing member so that a second end of the braking member can stop the wheel of a wheel unit connected to the wheel support arms.

[0007] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings, which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Figure 1 is an exploded view showing a brake system of the present invention;

[0009] Figure 2 is an exploded view showing a connection unit of the brake system of the present invention;

[0010] Figure 3 shows the profile of the upper cam and the lower cam in the connection unit;

[0011] Figure 4 shows a disk and a hole in the frame of the frame unit of the brake system of the present invention;

[0012] Figure 5 is a side view showing the braking member and the wheel, and

[0013] Figure 6 is a perspective view showing the caster with the brake system of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] Referring to Figures 1, 2, 3 and 6, a caster brake system of the present invention comprises a connection unit 1 having a connection plate 15 on a top thereof so as to be connected to a body of a stroller or a cart (not shown). A tubular member 151 is connected to an underside of the connection plate 15 and includes two first slots 1511. A sleeve 16 is received in the tubular member 151 from an underside of the tubular member 151 and has two second slots 162 which are located in alignment with the first slots 1511. A boss 1510 extends from an end of the tubular member 151 and the sleeve 16 has a flange 161 which has a recess 1610. The boss 1510 is engaged with the recess 1610. An upper cam 12 is rotatably received in the tubular member 151 and has a serrated underside 122 which includes first protrusions 1220. A passage 121 is defined in a top surface of the upper cam 12 and an operation bar 11 extends through the first slots 1511, the second slots 162 and the passage 121 of the upper cam 12 such that the upper cam 12 is rotated by operating the operation bar 11. A lower cam 13 is movably received in the tubular member 151 and has a serrated top 131 which has second protrusions 1310. The lower cam 13 is moved downward when a peak of each of the first protrusions 1220 contacts a peak of the second protrusion 1310 corresponding thereto. A polygonal member 132 extends from the underside of the lower cam 13 and a disk 14 has a polygonal hole 141 through which the polygonal member 132 extends. A spring 17 is located between the underside of

the lower cam 13 and the disk 14. A first C-shaped clip 19 fixes an end of the spring 17 to the lower cam 13. The disk 14 has teeth 141 on an outer periphery thereof.

[0015] Further referring to Figure 4, a frame unit 2 has a frame having an open top so as to receive the lower cam 13 therein and a hole 210 is defined through a bottom of the frame. A plurality of notches 2101 is defined in an inner periphery of the hole 210 so as to match with the teeth 142 of the disk 14 when the disk 14 is moved toward the hole 210. A bearing 18 is engaged with the open top of the frame and the tubular member 151 is received in a central hole of the bearing 18. A second C-shaped clip 20 positions the bearing 18 in the frame. Two plates 23 are connected to an underside of the frame and two wheel support arms 22 extend from the two plates 23.

[0016] Further referring to Figure 5, a braking unit 3 includes a pushing member 31 which has a pivot hole 311 and a pin 50a extends through the pivot hole 311 and the plates 23, such that the pushing member 31 pivotably located between the two plates 23 and a first end of the pushing member 31 can be pushed by the polygonal member 132 of the lower cam 13. The pin 50a has a groove 51a defined in an end thereof which extends through the two plates 23, and a C-shaped clip 52a engaged with the groove 51a. Each plate 23 has a lug 231 and a U-shaped braking member 32 having two legs are located on an outside of the two lugs 231. A pin 50b extends through holes 320 in the two legs of the braking member 32 and holes 2310 in the two lugs. The pin 50b has a groove 51b defined in an end thereof and extends through the two lugs 231, a C-shaped clip 52b is engaged with the groove 51b. A first end 321 of the braking member 32 can be pushed by a second end 312 of the pushing member 31 when the pushing member 31 is pivoted by the movement of the polygonal member 132. A cushion member 24 is located between the two plates 23

and has two through holes 242 such that pins 50 extend through holes 234 in the two plates 23 and the through holes 242 in the cushion member 24. The two wheel support arms 22 each have a first end thereof connected to the cushion member 24 at a center of the cushion member 24, and an axle 70 extends through holes 221 in the two wheel support arms 22 and a central hole 241 in the center of the cushion member 24. The axle 70 has two grooves 70a on two ends thereof and two C-shaped clips 70b are respectively engaged with the two grooves 70a to position the axle 70.

[0017] A wheel unit 4 is connected to two respective second ends of the wheel support arms 22. The wheel unit 4 includes a first part 41a and a second part 41b, both of which are respectively connected to the wheel support bars 22 by extending a shaft 60 through a central hole 410 in each of the first part 41a and the second par 41b and two holes 220 in the two wheel support arms 22. A first bush 25 is located between the two wheel support arms 22 and two second bushes 44 are respectively located between the two wheel support arms 22 and the first part 41a and the second part 41b. The shaft 60 has an enlarge end 61 at a first end thereof and is stopped on an outside of the first part 41a, a threaded hole is defined in a second end of the shaft 60 and a screw 80 is engaged with the threaded hole from an outside of the second part 41b. Each of the first part 41a and the second part 41b includes snap holes 412, two caps 43 are respectively mounted to the first part 41a and the second part 41b by inserting tongue members 431 on an inside of the caps 43 through the snap holes 412 of the first part 41a and the second part 41b. A cover 42 is mounted to the frame and receives the two plates 23 in the cover 42. The cover 42 is composed of two halves that are connected with each other by screws 90 engaged with threaded holes 420 in the two halves. An annular shoulder surface 411 is defined in the inside of each of the first part 41a and the second part 41b such that the second end 322 of the braking

member 32 contacts the shoulder surfaces 411 and the wheel is stopped when the first end 321 of the braking member 32 is pushed by the second end 312 of the pushing member 31.

[0018] When braking, the disk 14 combines the frame as a one piece by matching the teeth 142 with the notches 2101 of the hole 210 such that the frame cannot rotate when the wheel is stopped.

[0019] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.